



CALIFORNIA ENERGY COMMISSION

Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

Advisory Committee Meeting

February 12, 2015

San Joaquin Valley Air Pollution Control District
Fresno



Meeting Agenda

- 10:30 Introductions and Opening Remarks
- 10:45 Program Status Update
- 11:15 Development of 2015-2016 Investment Plan Update
- 11:45 Advisory Committee Comments and Discussion
- 12:30 Lunch
- 1:30 Advisory Committee Comments and Discussion, cont.
- 2:30 Public Comment
- 3:00 Adjourn



Program Status Update

Jim McKinney
Program Manager



California Transportation: Nation-State Statistics

- Population: 38 million
- GDP: \$2.0 trillion - 8th largest global economy
- GHG Emissions: 458 MMT (2012)
 - Transportation accounts for 36 % of all GHG emissions
- Air Pollution: Severe Non-Attainment for Ozone
 - San Joaquin and South Coast Air Basins
- Vehicles: 27.5 million cars + 0.9 million trucks
- Annual Fuel Consumption: 18.1 billion gallons
 - 14.5 billion gallons gasoline + 3.6 billion gallons diesel
- Primary Roadways: 170,000 miles



Origins in Statute

Assembly Bill No. 8

CHAPTER 401

An act to amend Sections 41081, 44060.5, 44125, 44225, 44229, 44270.3, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 of, the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9261.1, and 9853.6 of the Vehicle Code, relating to vehicular air pollution, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 28, 2013. Filed with Secretary of State September 28, 2013.]

LEGISLATIVE COUNSEL'S DIGEST

AB 8, Perea. Alternative fuel and vehicle technologies: funding programs. (1) Existing law establishes the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the State Energy Resources Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or not-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

This bill would provide that the state board has no authority to enforce any element of its existing clean fuels outlet regulation or other regulation that requires or has the effect of requiring any supplier, as defined, to construct, operate, or provide funding for the construction or operation of any publicly available hydrogen-fueling station. The bill would require the state board to aggregate and make available to the public, no later than June 30, 2014, and every year thereafter, the number of hydrogen-fueled vehicles that motor vehicle manufacturers project to be sold or leased over the next 3 years, as reported to the state board, and the number of hydrogen-fueled vehicles registered with the Department of Motor Vehicles through April 30. The bill would require the commission to allocate \$20 million annually, as specified, until there are at least 100 publicly available hydrogen-fueling

Established by Assembly Bill 118
(Nunez, 2007)

✓ \$100 million per year

Funding extended through January 1, 2024
by Assembly Bill 8 (Perea, 2013)

“...develop and deploy innovative technologies that transform California’s fuel and vehicle types to help attain the state’s climate change policies.” (Health and Safety Code Section 44272(a))

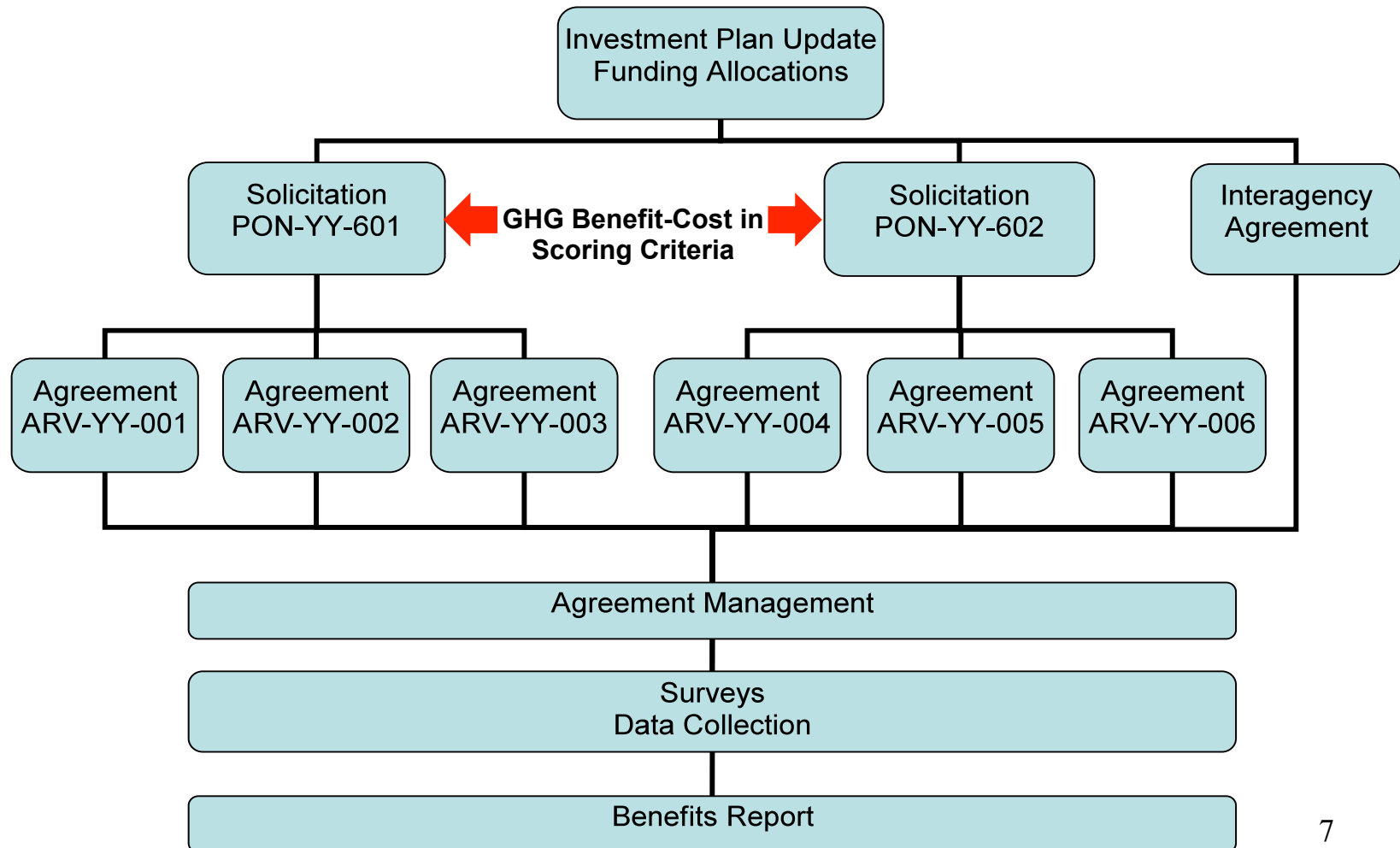


Key Policies and Regulations

Policy Objectives	Policy Origin	Goals and Milestones
Greenhouse Gas Reduction	AB 32, Executive Order S-3-05, LCFS	Reduce greenhouse gas emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050 in California
Petroleum Reduction	California <i>State Alternative Fuels Plan</i>	Reduce petroleum fuel use to 15% below 2003 levels by 2020 in California
Low Carbon Fuel Standard	AB 32, California Global Warming Solutions Act	10% reduction in carbon intensity of transportation fuels in California by 2020
Federal Renewable Fuel Standard	Energy Policy Act of 2005, Energy Independence and Security Act of 2007	36 billion gallons of renewable fuel by 2022
Air Quality	Clean Air Act	80% reduction in NOx from current levels by 2023
ZEV Mandate	California Executive Order B-16-2012	Accommodate 1 million EVs by 2020 and 1.5 million by 2025 in California



Program Implementation



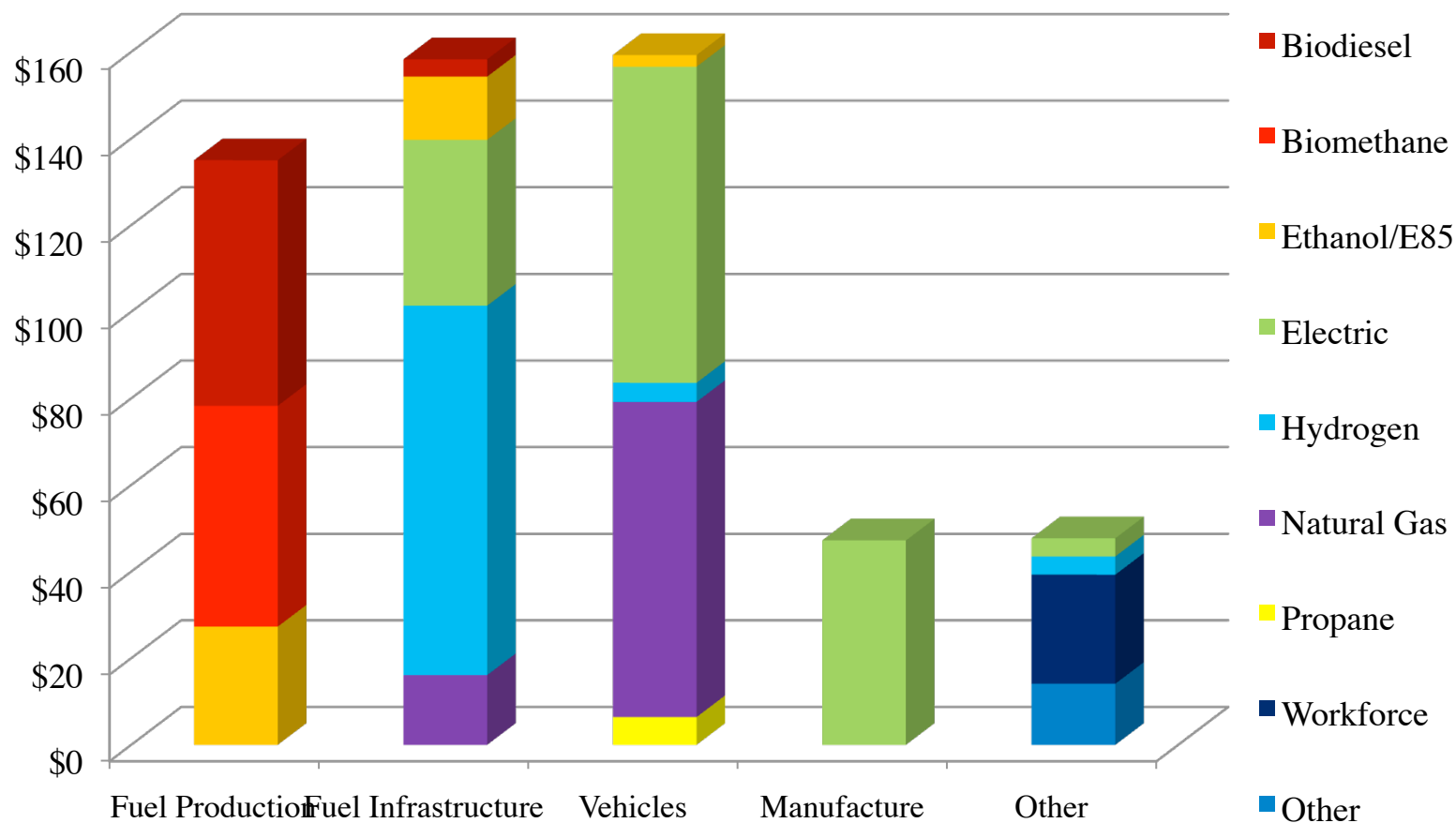


ARFVTP Funding Summary: 2009-2014

Investment Areas	Funding Amount (in millions)	Percent of Total (%)	Number of Awards
Biofuels	\$158	29	56
Electric Drive	\$163	30	134
Natural Gas	\$95	17	182
Hydrogen	\$94	17	28
Workforce Development	\$25	5	55
Market & Program Develop.	\$12	2	15
Total	\$547	100	470



Existing Agreements: 2009-2014





Geographic Distribution of ARFVTP Funding by Air District

Air District	Total Funding Amount (\$ millions)	Percent of Total	Percent of State Population
Bay Area	92.9	17.0%	18.4%
Monterey	3.5	0.6%	2.0%
Sacramento	21	3.8%	3.6%
Santa Barbara	3	0.6%	1.1%
San Diego	20.6	3.8%	8.4%
San Joaquin	80.6	14.7%	10.5%
South Coast	157.5	28.8%	44.0%
Ventura	1.7	0.3%	2.2%
Yolo-Solano	21.1	3.9%	0.9%
Other Nor Cal Districts	15.8	2.9%	8.9%
Other So Cal Districts	3.1	0.6%	
Statewide	126.1	23.1%	-
Total	547.3	100.00%	100.00%



Electric Vehicle Support

Total EVSE Funding: \$38.3 million

Total Funded = 9,369 chargers

Commercial = 3,373

Residential = 5,127

Workplace = 756

DC Fast = 113

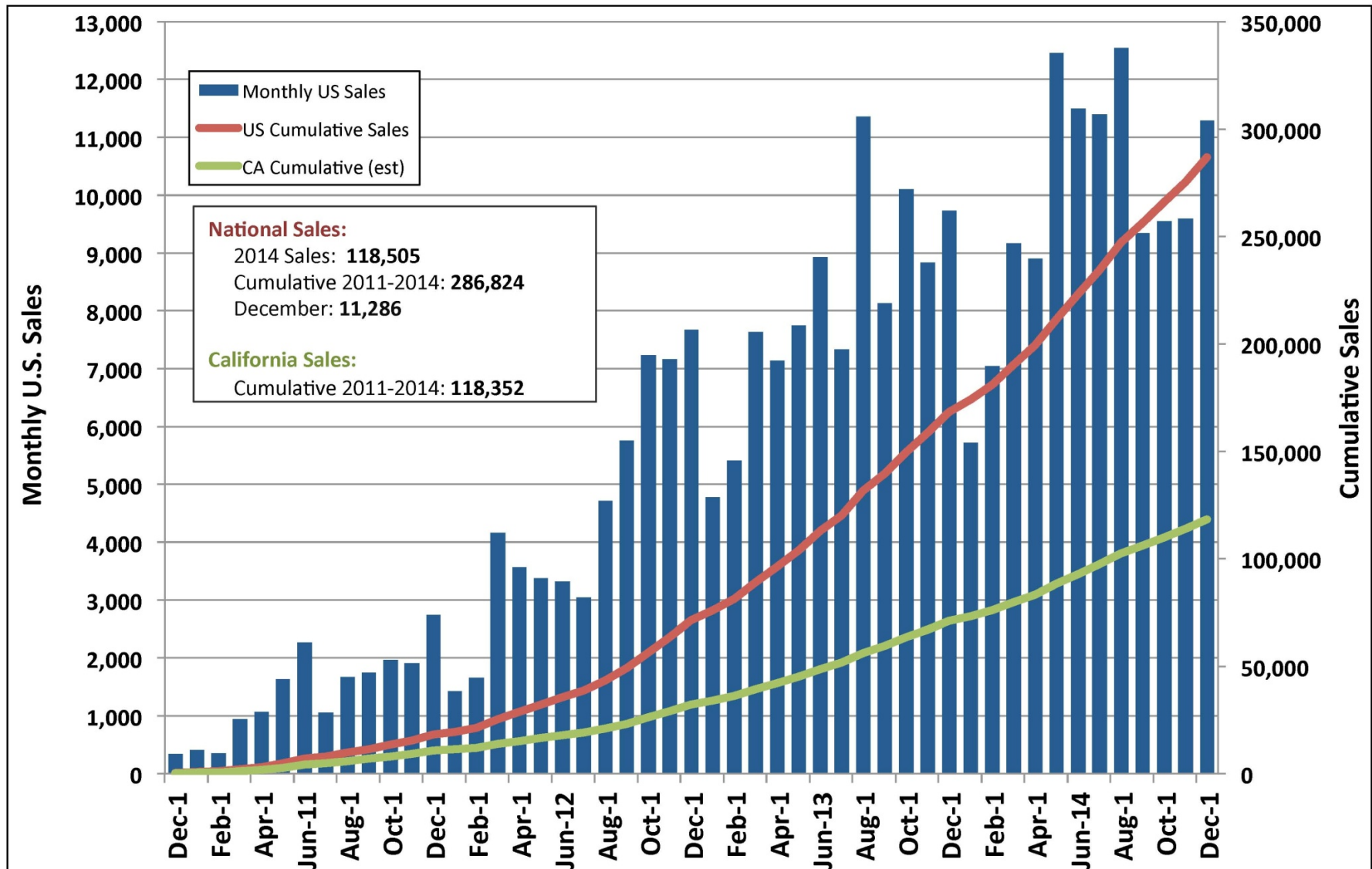
Plus 21 Regional Readiness
Planning Grants = \$45.1 M

Total CVRP Support:
= \$49 million

- Over 21,000 vouchers



PEV Sales Through Dec. 2014



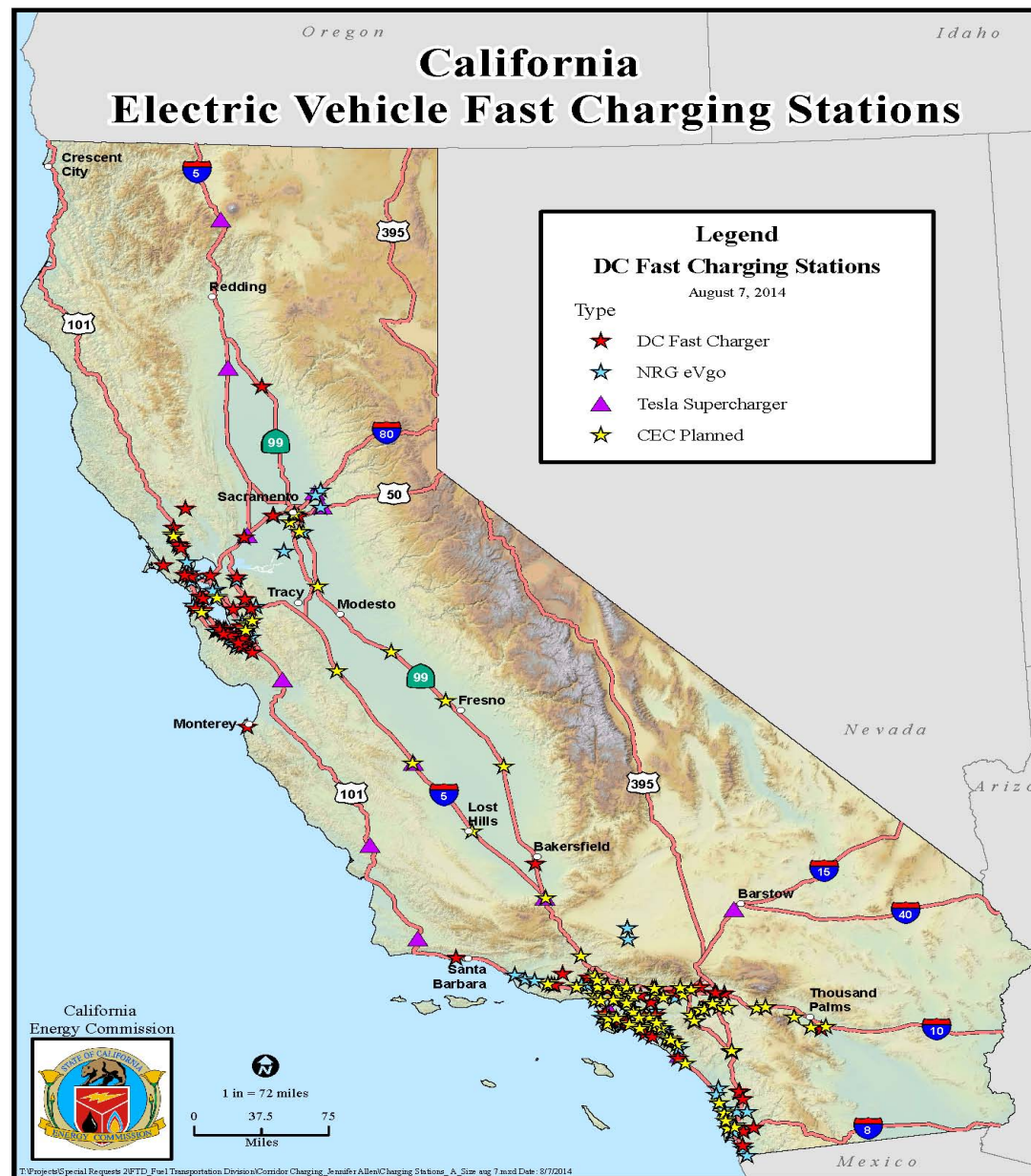
Note: Approximation assumes CA sales are 40% of national sales.

Reference: www.hybridcars.com

1/7/2015



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San Joaquin Valley Charger Installations

8 DC Fast Chargers at Hotels

Fresno, Merced, Stockton, Wheeler Ridge, Tulare, Lost Hills,
Coalinga, Santa Nella

San Joaquin Valley APCD

2 Level 2 Chargers

Fresno State University

2 DC Fast Chargers and 4 Level 2

Fresno

3 MUD Chargers

Caltrans – Fresno

1 Level 2 Charger

Clipper Creek Reconnect California

10 Level 2 Chargers throughout SJ Valley





Hydrogen Station Funding

Funding to Date = \$90 million

Public Station Funding

45 New Stations	= \$72.7 million
3 Station Upgrades	= \$6.7 million
4 Station O&M Grants	= \$1.2 million
1 Mobile Refueler	= \$0.9 million



Other Funding Activities

AC Transit Fuel Cell Bus Station	= \$3 million
CDFA Div of Weights and Measures	= \$4 million
Retail Dispensing Fuel Standards	
UC Irvine STREET Model	= \$1.5 million
GoBiz Ombudsman Support	



January 2015

Northern CA Hydrogen Stations

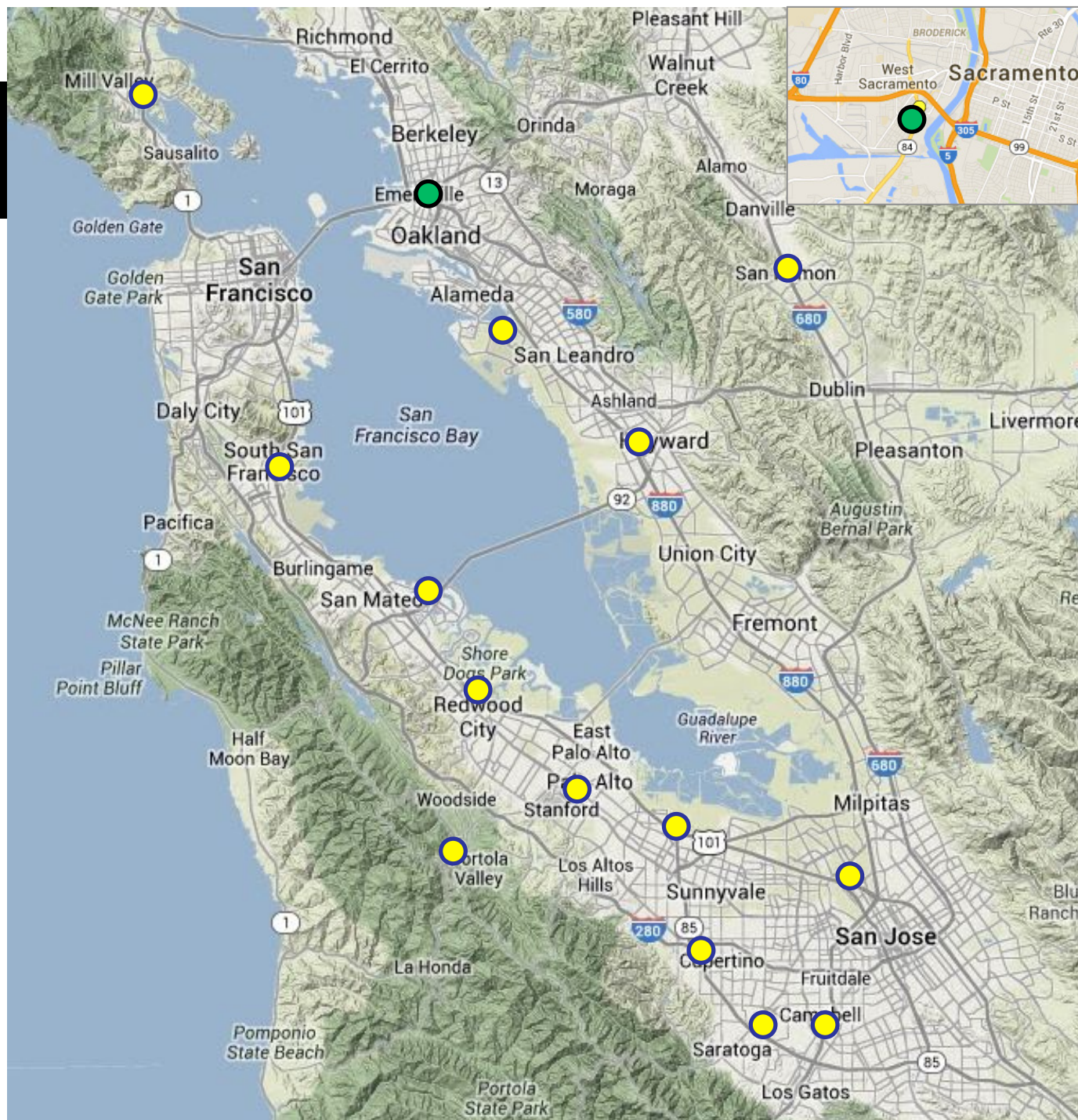
Operational

Emeryville – AC Transit
West Sacramento

In Development

Campbell
Cupertino
Foster City
Hayward
Mill Valley
Mountain View
Oakland
Palo Alto
Redwood City
*Rohnert Park
San Jose
San Ramon
Saratoga
South San Francisco
*Truckee
Woodside

**Not shown on map*



January 2015

Southern CA Hydrogen Stations

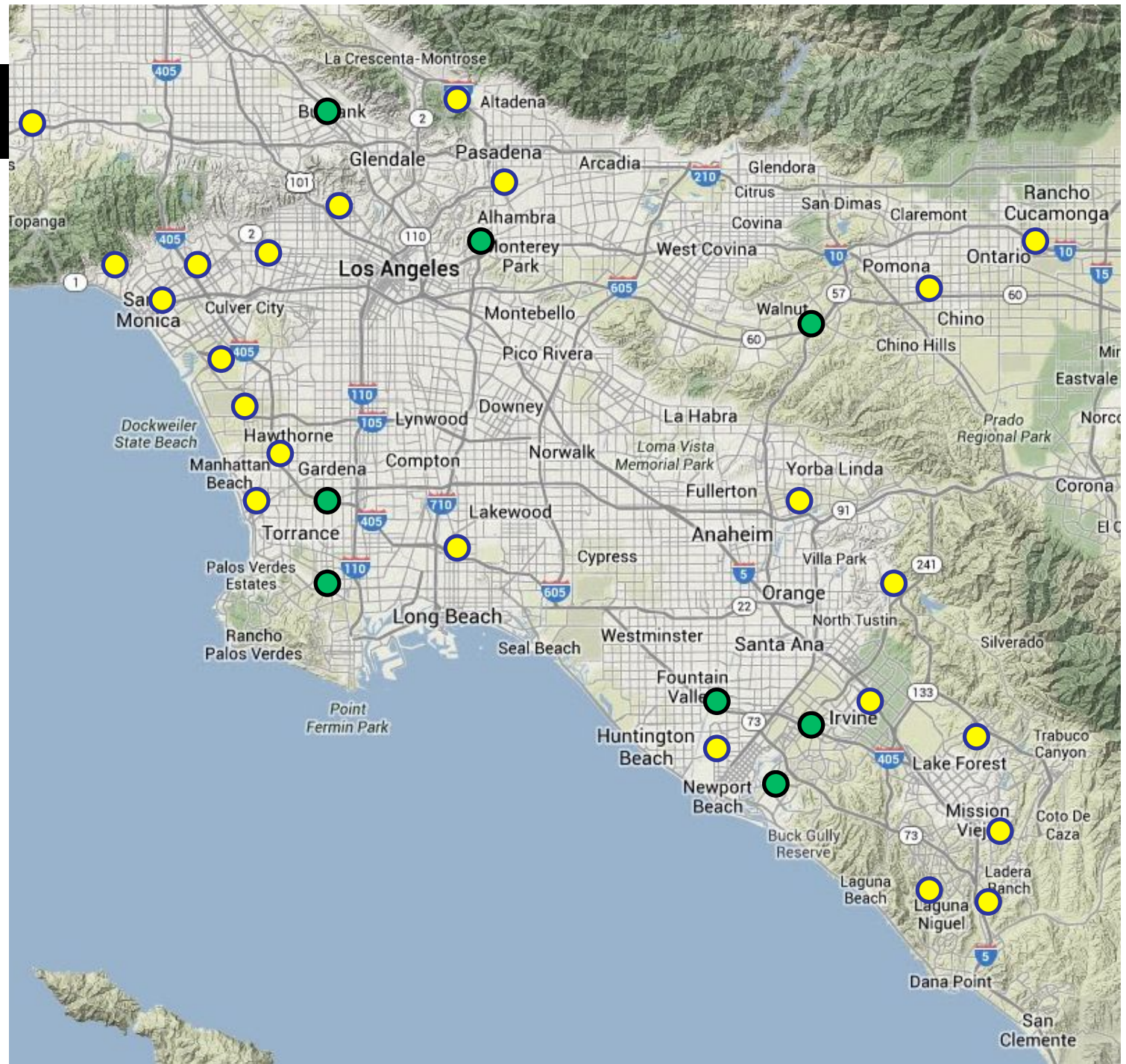
● Operational

Burbank
Diamond Bar
Fountain Valley – OCS
Irvine – UC Irvine
Los Angeles – Cal State LA
Los Angeles – Harbor City
Newport Beach
*Thousand Palms – SunLine Transit
Torrance

● In Development

Anaheim
Chino (upgrade)
*Coalinga
Costa Mesa
Irvine - Walnut Ave.
La Canada Flintridge
Laguna Niguel
Lake Forest
Lawndale
Long Beach
Los Angeles - Beverly Blvd.
Los Angeles – LAX (upgrade)
Los Angeles - Lincoln Blvd.
Los Angeles - Hollywood Blvd.
Los Angeles - West LA 2
Los Angeles - Woodland Hills
Mission Viejo
Ontario
Orange
Pacific Palisades
Redondo Beach
*Riverside
*San Diego
*Santa Barbara
San Juan Capistrano
Santa Monica
South Pasadena

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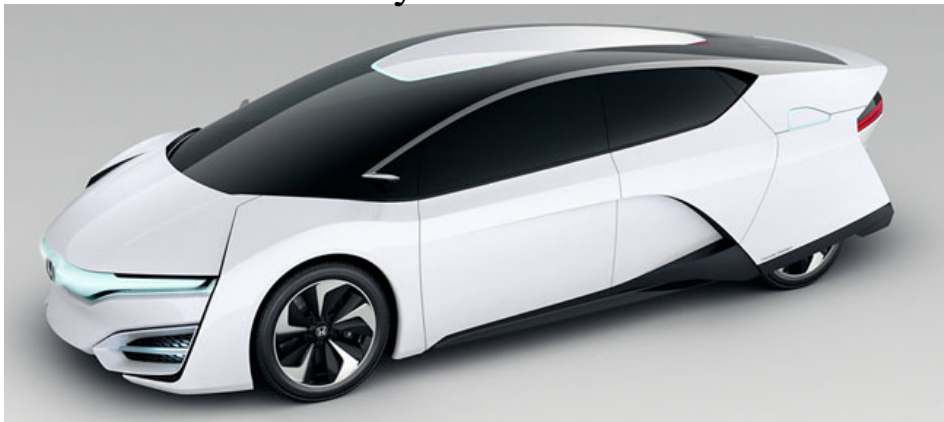




FCEV Market Launch: 2014-2016



Toyota Mirai



Honda Concept FCV



Hyundai Tucson





ARFVTP Truck Sector-Related Funding

About 30 Percent of Total Program Funding

Technology	Funding (\$ Millions)	No. of Vehicles, Fueling Stations or Projects
Commercial Natural Gas Trucks	54.3	2,735 Trucks
Natural Gas Infrastructure	16.7	60 Stations
Commercial Propane Trucks	6.4	514 Trucks
Commercial ZEV Trucks (Class 6 package delivery)	4.0	160 Trucks
Advanced Technology Truck Demonstration or Manufacturing	74.6	38 Projects
Total Funding	156.0	19



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Proterra Electric Bus Demonstration for Stockton RT

- \$2.59 million grant
- 2 fast charge buses





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Motiv Electric Drive School Buses



Demonstrated in
Kings Canyon Unified
School District

Electric drivetrains and
controls developed through
ARFVTP grants



EVI-UPS Electric Truck in West Sacramento

EVI-UPS 100 Truck Deployment Project



Electric Vehicles
International:
Stockton, CA

EVI Capacities:

- Electric Drivetrains on new and retrofit chassis





ARFVTP Natural Gas Investments in SJ Valley

4 CNG Stations - \$1.1 million total grants

- Lodi Unified School District
- Kings Canyon Unified School District
- City of Visalia
- City of Lemoore

DMV Data Show ~ 2,000 Medium and Heavy Duty Trucks
~ 1,800 Light Duty Vehicles



ARFVTP Biofuels Funding

Fuel Type	Funding (\$ millions)	No. of Projects	Production (MGY)
Biomethane	50.9	15	9.6
Ethanol	23.5	11	8.9
Cellulosic Ethanol	3.9	1	0.021
Biodiesel	36.1	12	78.8
Renewable Diesel	17.1	5	47.9
Total	131.5	44	145.2

E85 Infrastructure: \$14.6M for 161 Stations

Biodiesel Tank Storage: \$4M for 4 projects



ARFVTP San Joaquin Valley Biofuels Investments

15 Biofuels Projects Totaling \$67.5 million

- Crimson Renewable Fuels Biodiesel – Bakersfield
- Community Fuels Biodiesel – Stockton
- Great Valley Sweet Sorghum Trials - Bakersfield
- EdeniQ Cellulosic Ethanol - Visalia
- Pixley Biogas – Calgren Ethanol – Tulare
- Colony Energy Biogas – Tulare
- Grain Sorghum: Pacific Ethanol, Aemetis, Calgren



Crimson Renewable Fuels Biorefinery Expansion

**Bakersfield
Biorefinery
Expansion to
17 MGY**

Waste-Based
Biodiesel

\$5million grant

14 gCO₂e/MJ





Pixley Biogas – Calgren Ethanol Biorefinery



\$4.6 million ARFVTP Grant

Develop Biogas from Dairy Farm Waste

Reduce Calgren's Natural Gas Consumption by 6%
Reduce Calgren's Carbon Intensity Score to 67 gCO₂e/MJ

Lowest Carbon Industrial Scale Ethanol in California



Workforce Development and Training

Partner Agency	Funded Training (in Millions)	Match Contributions (in Millions)	Trainees	Businesses Assisted	Municipalities Assisted
ETP	\$7	\$9.9	12,675	92+	14+
EDD	\$7.25	\$7.5	999	36+	-
CCCO	\$5.5	N/A	NA	480+	-
Total	\$19.75	\$17.4	13,674	608+	14+



Projected Carbon Reduction Benefits from ARFVTP Investments

Results from NREL's 2014 Analysis of Expected and Market Transformation Benefits

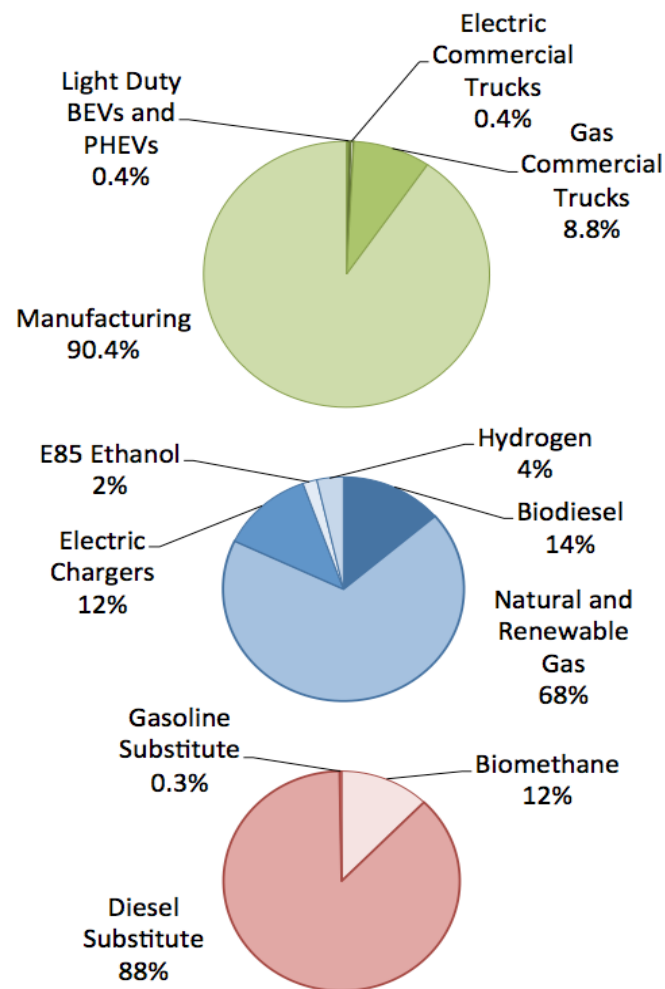
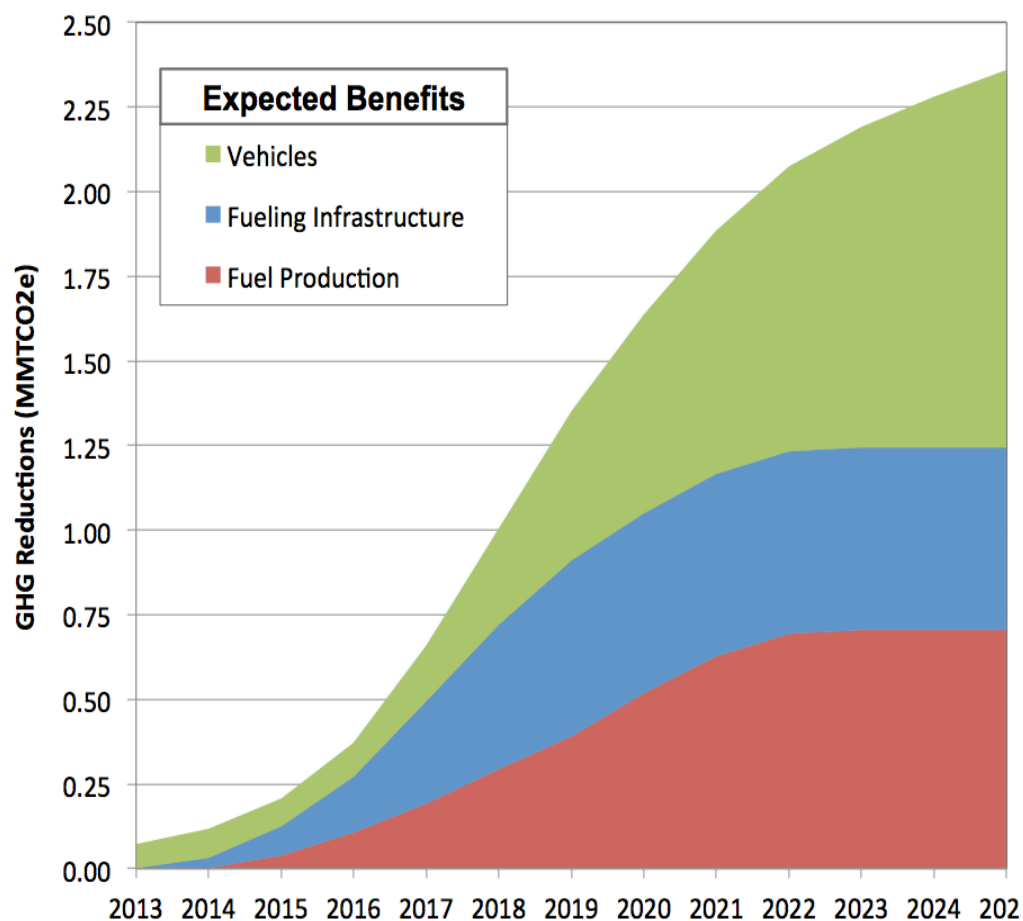
http://www.energy.ca.gov/2014_energypolicy/documents/#06122014

- **Dr. Marc Melaina, Principal Investigator**
 - Analyzed 290 projects totaling \$515 million



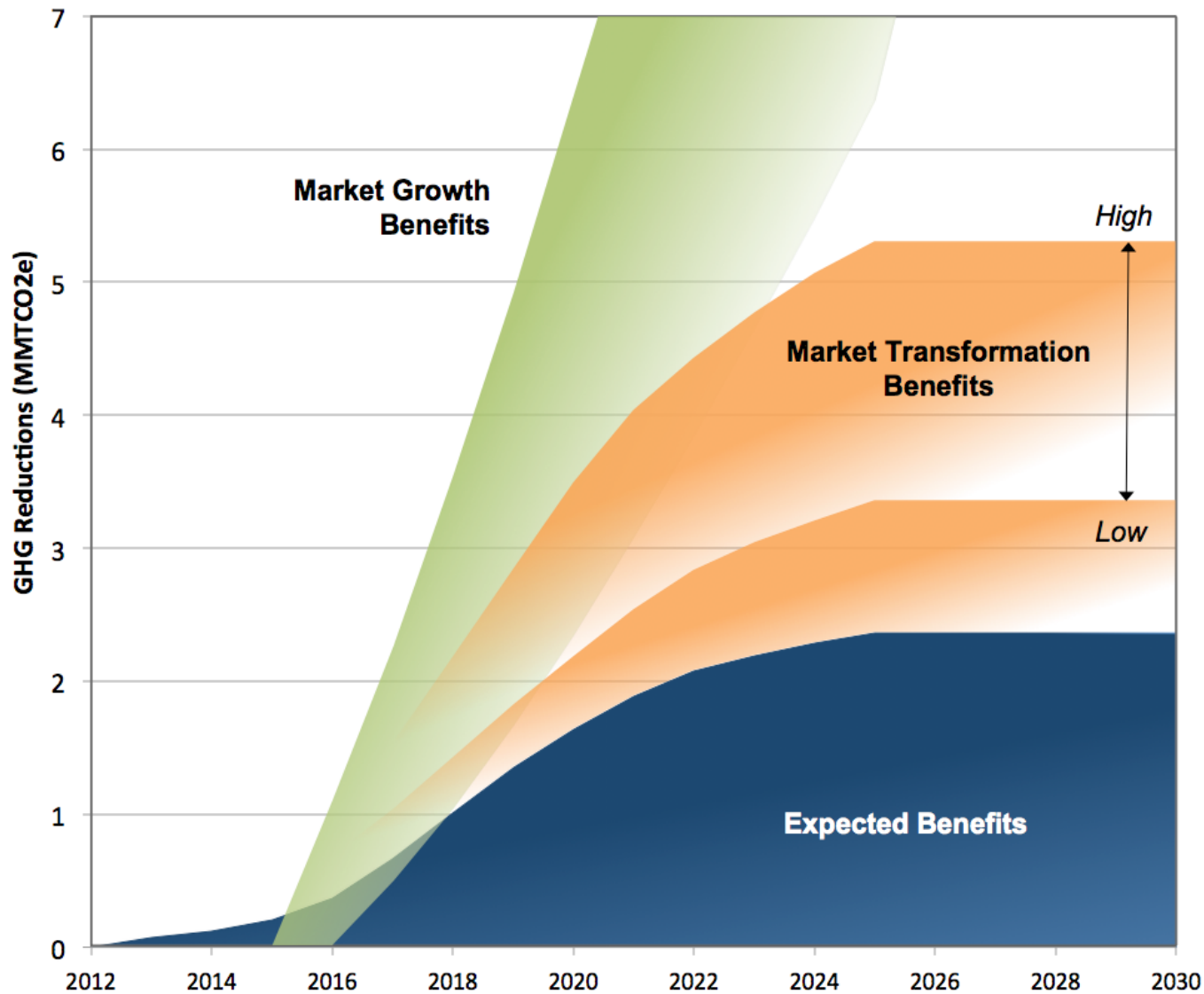
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Expected GHG Reductions of Projects Funded to Date





Cumulative Carbon Reduction Benefits





Recent Solicitations and Awards

(since last Advisory Committee meeting in November 2014)

Subject	Awards (# and ARFVTP \$)	Notes
Regional Readiness ZEV Planning	8 awards \$2.03 million	<ul style="list-style-type: none">• SJ Valley APCD award• ZEV Planning and Implementation• First Hydrogen Planning Award
Biofuel Production: Pilot or Commercial Scale	1 additional award \$3.4 million	<ul style="list-style-type: none">• Viridis Biofuels, Oakland CA



Current Solicitations

Subject	\$ Available	Notes
Manufacturing	\$10M available; Max. \$3M per project	<ul style="list-style-type: none">• Must produce alternative fuel vehicles or their components• Notice of Proposed awards expected February 2015
Biofuel production: Early and pre-commercial technology development	\$3M available; Max. of \$1M per project	<ul style="list-style-type: none">• Focused on R&D phase• Open to diesel substitutes, gasoline substitutes (not corn grain), biomethane• Abstracts due December 17• Full proposals due April 23
San Joaquin Valley Center	\$1.19M	<ul style="list-style-type: none">• Develop a center to demonstrate and promote alternative fuels and vehicles in the SJ Valley



Current Solicitations

Subject	\$ Available	Notes
ZEV Readiness Planning	\$1.29 M	<ul style="list-style-type: none">• Continue to solicit ZEV Readiness and Implementation Proposals• Proposals due February 28
Medium- and Heavy-Duty Vehicle Demonstration	\$24.8M	<ul style="list-style-type: none">• Coordinating with ARB's proposed demonstration projects• Focused on earlier phases of technological development and commercialization• Maximum award: \$3 million• Deadline for proposals extended to Feb. 20



Potential Near-Term Solicitations

Subject	\$ Available	Notes
EV Charging Station Pilot Alternative Financing Program	\$1.9M	<ul style="list-style-type: none">• Pilot program with CPCFA• Loan Loss Reserve plus rebate• Costs could include L1, L2 and/or DC fast charger design, equipment, installation• Launch Q1/Q2 2015
Natural Gas Fueling Infrastructure	\$1.5M	<ul style="list-style-type: none">• May be limited to school and municipal fleets• Expected Q1 2015
Natural Gas Vehicle Incentives	\$10.2M	<ul style="list-style-type: none">• UC Irvine as potential administrator• Consumer-based incentive
Federal Cost Share / Emerging Technologies	\$2.7M	<ul style="list-style-type: none">• State match funding for federal awards• May include Intelligent Transportation Systems



Other Program Activities

2014 Transportation IEPR

- Revised Final Draft Posted January 28
- Will be heard and possibly adopted at February 25 Business Meeting
- Comment period closed February 11

3103 Rulemaking to Revise Funding Prohibitions

- Commission to assess staff recommendation to proceed with rulemaking at February 25 Business Meeting